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CONTENTS

AIRCRAFT SPEED INSTRUMENTS

A comparison of the report on Aircraft Speed Instruments, just published by the National Advisory Committee for Aeronautics as Technical Report No. 420, with an earlier paper on the same subject, Aircraft Speed Instruments, Technical Report No. 127, 1922, shows from a new angle the rapid strides which aviation has made in the past decade. Practically all of the air-speed meters described in the earlier paper as in ordinary service are now obsolete. The pitot-static tube type has become the standard. Indicators have been standardized and their accuracy greatly increased. Their range of indication has also been much extended, not only for the higher speeds of present-day airplanes but also for lower speeds. Metallic cases have been entirely displaced by cheaper, lighter, noncorrosive cases of bakelite or similar materials.

Naturally, the report devotes special attention to the pitot-static tube meter. The Venturi forms, so important in 1922, are only briefly discussed as they are now used very rarely. Other sections of the report cover anemometers of the Robinson cup-and-vane types, pressure-plate instruments, and hot-wire anemometers.

An interesting instrument of the vane-anemometer type is the suspended head air-speed meter developed at the Bureau of Standards for use on airships such as the *Los Angeles* and *Akron*. The instrument consists of a 2-bladed fan at the nose of a streamlined case, which is suspended by cable about 40 feet below the control car where it is unaffected by disturbances of the air due to the movement of the airship. The fan is set into rotation by the motion of the case through the air and the speed of rotation of the fan is transmitted electrically by apparatus in the case to the dial of an instrument in the control car, which is graduated to give indications of air speed.

The report also contains a discussion on methods of ground-speed measurement, with references to the more important modern instruments.

A bibliography on air-speed measurement is included for those who wish to go into the subject in more detail.

CHARACTERISTIC EQUATIONS OF INCANDESCENT ELECTRIC LAMPS

The manufacture of tungsten-filament incandescent lamps has changed very rapidly during recent years, and methods of lamp photometry have nec-

essarily been altered along with the lamps. Photometric measurements have passed very largely from a mean horizontal candlepower basis to a lumen basis. The tables of characteristic relations of vacuum lamps, published in 1914 and based on measurements of horizontal candlepower, are no longer adequate for the newer types and larger sizes of lamps.

In Research Paper No. 502, to be published in the December number of the Bureau of Standards Journal of Research, logarithmic equations of the second degree are shown to apply to vacuum lamps and to gas-filled lamps in three steps. The equations describe the characteristics of miniature lamps as well as large lamps. Tables of characteristic relations, based on normal efficiencies of 10.0, 12.5, and 16.0 lumens per watt, computed by means of the characteristic equations, furnish means for ready calculation of light output, current, power input, and operating efficiency over a range of voltages from 55 per cent of normal voltage for vacuum lamps, and 80 per cent of normal voltage for gas-filled lamps, to 120 per cent of normal voltage for all types and sizes up to 150 watts, and to 132 per cent of normal voltage for large gas-filled lamps, sizes 200 watts and up.

THE OERSTED

At its plenary meeting in Oslo in July, 1930, the International Electrotechnical Commission adopted the name "oersted" for the unit of magnetizing force (magnetic intensity). As the commission has no legal authority, the application of its recommendations in practice depends upon the attitude of technical organizations in the various countries concerned. In the United States the name "oersted" was previously used for the unit of magnetic reluctance, and this fact made the acceptance of the new proposal somewhat doubtful. The new use of the name has, however, been accepted by authoritative technical bodies.

The American Society for Testing Materials through its committee on magnetic properties has adopted the name and included it in its latest revision of specifications for methods of test for magnetic properties of iron and steel, and also in its tentative definitions of terms, with units and symbols, relating to magnetic testing.

The sectional committee on electrical definitions of the American Standards Association under the sponsorship of the American Institute of Electrical Engineers in its report of August, 1932 (C42–1932), accepts the name "oersted" for the cgs electromagnetic unit of magnetic intensity. A further indication of the general acceptance of the term is its use by the authors of several recent articles on magnetic subjects.

In accordance with the general principle of following accepted practice as indicated by the decisions of authoritative technical bodies, the bureau has adopted for its own use the name "oersted" for the unit of magnetizing force or magnetic intensity. The term "gilbert per cm" previously used still has the same significance and may be used interchangeably with "oersted" if preferred.

DEFLECTION OF COSMIC RAYS BY A MAGNETIC FIELD

Considerable interest has been shown recently in the nature of cosmic rays. Several investigators have tried to get some information on this point by attempting to deflect these rays in a magnetic field. Assuming them to be of a corpuscular nature, for example, electrons or protons traveling at very high speeds, they should be capable of deflection in a magnetic field, providing the field were sufficiently strong for the purpose. If, on the other hand, the cosmic rays are wave radiation, similar to light of extremely short wave length, or neutral particles (neutrons), there would be no deflection no matter how strong the magnetic field. Previous experiments of this kind by Rossi in Italy and Mott Smith in the United States have shown that apparently no deflection exists. Their experiments were carried out by permitting the cosmic rays to pass through thick pieces of magnetized iron.

Research Paper No. 509, which will be published in the December number of the Bureau of Standards Journal of Research, describes experiments recently made at the bureau, in which a magnetic field is produced in air so that no disturbance, such as might be produced by the iron in the other experiments, can occur. The arrangement used was calculated to be sufficient to remove 10^9-volt electrons from the beam, and the purpose of the experiment was to try to detect the existence of a deflection by a reduction in the number of rays when passed through a magnetic field. The result of 1,000 hours' observation

shows that, whereas 1.3 rays pass through the apparatus per hour with no magnetic field, only 0.9 ray per hour are observed when the field is applied. This seems to indicate that about 30 per cent of the rays are removed by being deflected in the magnetic field and that the remaining 70 per cent are deflected less than 10^5-volt electrons would be deflected by a magnetic field.

NEW GLASS ELECTRODE FOR MEASURING ACIDITY OF SOLUTIONS

The glass electrode is an instrument developed recently for measuring the degree of acidity of solutions. Unlike many other electrodes, it is unaffected by strong oxidizing and reducing agents. This makes it suitable in certain lines of research and industrial control; for instance, in the measurement of the degree of acidity of chromium plating baths, which consist mainly of chromic acid. The glass electrode also requires no addition of reagents, such as gases or solids, to the fluid sample wherever located. This makes it suitable for many biological measurements.

The chief disadvantages of the previous forms of glass electrodes have been the extreme fragility of the thin glass walls, leading to short life, and the high resistance of the glass, requiring delicate indicating instruments. An extra standard electrode has also been used for completing the circuit.

In work recently completed at the bureau, a metal-connected glass electrode was developed and found to be fairly accurate. A metallic coating was applied directly to the glass, which eliminated the extra standard electrode. The glass wall was made thicker, therefore less fragile. The resistance was kept down by using larger surfaces. As the metal furnishes support to the glass, it is probable that compactness could be regained whenever necessary by applying very thin coatings of glass to rigid metal conductors. The instrument will be fully described in Research Paper No. 511, to be published in the December number of the Bureau of Standards Journal of Research.

MEASUREMENT OF LOW-VOLTAGE X-RAY INTENSITIES

The accurate measurement of 9 to 12 kv X rays (so-called grenz rays), in terms of the ionization produced in free air, has been open to serious doubt because of the relatively high absorption of the radiation in air. At higher voltages (above 90 kv) this difficulty has been minimized through the use of the guarded field ionization chamber in place of the former simple parallel plate chambers. The principles of this chamber have now been extended by the Bureau of Standards to a very much smaller type wherein the air absorption path is reduced to 5 cm (about one-third the path in any other type of correctly proportioned chamber).

In Research Paper No. 505, to be published in the December number of the Bureau of Standards Journal of Research, it is shown that the air-absorption correction must be determined separately for every beam of radiation measured, since the radiation quality is not readily controlled by ordinary means. Heretofore it has been necessary to determine the air absorption by separate special apparatus which is usually very complicated. The present chamber, however, is so designed that the air absorption may be determined directly and without recourse to any other apparatus. This simplification renders it possible to make a complete determination of the X-ray beam intensity at any point with only three measurements. Complete details are given for making all measurements.

The chamber is so designed that it may be used up to 80 kv, and hence may be compared directly with the bureau's primary standard ionization chamber for proof of its accuracy. This likewise makes the chamber suitable for accurate measurements of X-ray intensities produced by the lower diagnostic voltages (50 to 90 kv). Heretofore this has been possible only by means of thimble chambers of which the accuracy at such voltages has not been satisfactorily demonstrated. Compared against the larger guarded field standard chamber at 40 to 90 kv, the new chamber shows an over-all accuracy of ± 0.5 per cent.

A MULTIPLE-RANGE POTENTIOMETER FOR MEASURING SMALL TEMPERATURE DIFFERENCE

In determining, as a criterion of purity, the boiling range or the freezing range of a liquid which is being fractionated, it is desirable to measure accurately the difference between the boiling points or the freezing points of the two end fractions. This is conveniently done by efficiently distilling the purified liquid and placing the initial fraction in one of the twin boil-

ing or freezing baths and the end fraction in the other bath. The reference junction of a thermoelement is placed in one of these baths and the measurement junction in the other. The difference in temperature between these baths serves to determine the degree of purity of the liquid, or the progress of the fractionation. When the pure liquid is available, it may be used in one of the baths as a means of obtaining the reference temperature directly.

In the initial stages of the fractionation, the boiling points or freezing points of the fractions may differ by several degrees. Only very moderate accuracy in the measurement of this difference is required. As the work proceeds, however, the temperatures approach equality more and more closely, and the means for measuring their difference must become correspondingly sensitive and accurate in order to afford a sufficiently precise index of the degree of purity attained.

In the bureau's work on the isolation of some of the hydrocarbons from petroleums, it was desired to measure temperature differences ranging from 5° down to 0.001° C. It was decided to use 10 copper-constantan thermocouples in series. Their electromotive force, which is a measure of the difference of temperature of their junctions, had to be measured by some form of potentiometer. No commercial potentiometer would meet all of the special requirements of the case, one of which was that the measurement circuit, including any keys and switches present in it, should not show a parasitic thermal electromotive force as great as 0.04 mv, even under adverse thermal conditions. It was further desired that the potentiometer be arranged to indicate temperature difference directly to avoid the necessity of determining this difference by reference to tables or curves.

Research Paper No. 506, which will be published in the December number of the Bureau of Standards Journal of Research, describes a multirange potentiometer readily adaptable to meet the above requirements. It operates on the relatively little used "second method" of Poggendorff, in which an adjustable, measured current is passed through a fixed resistor to produce a known difference of potential which balances the unknown electromotive force under measurement. In the present case the fixed resistor is tapped to give six values of resistance in the ratio of the numbers 1, 2, 5, 10, 20, 50, which provides six ranges of measurable voltage. When adapted to read directly in temperature difference, scales of from 0 to 0.1°, 0.2°, 0.5°, 1°, 2°, and 5°, respectively, are available.

Measurements of temperature difference between the two baths had to be made with the mean bath temperature having any value from +50° to +300° C. Over this range there is an increase in the value of the electromotive force per degree for the given couples, the value at 300° being 1.35 times the value at 50°. Means had therefore to be provided to increase correspondingly the current required for full-scale deflection of the milliammeter. The adjustable shunt for accomplishing this change is fitted with a scale graduated in terms of mean bath temperature.

The severe requirements as to freedom from parasitic thermal electromotive force made it necessary to devise methods of construction of resistors and of keys of an extreme degree of freedom from such sources of error. The potentiometer contains means for readily detecting and neutralizing any parasitic electromotive force present in the external part of the measurement circuit, including the galvanometer.

IMPROVED RESISTANCE THERMOMETER

Platinum resistance thermometers are extensively used for temperature measurements where high accuracy is required. For many purposes, however, the existing forms of such thermometers are inconveniently large in diameter. The bureau has recently developed a design of resistance thermometer about half the size of previous types. The new instrument has about the same diameter as an ordinary mercury thermometer. The reduction in size has been made possible by the use of coiled platinum filaments similar to the tungsten filaments used in electric light bulbs. The coiled filament is inclosed in a glass tube which is filled with helium and hermetically sealed. The presence of the helium makes the thermometer quick acting by causing a rapid exchange of heat between the platinum coil and the glass tube.

The new instrument is described in Research Paper No. 508 which will be published in the December number of the Bureau of Standards Journal of Research.

PERMANENCE OF BOOK PAPERS

As a part of its testing of 229 books, new and old, that had been stored in various public libraries, the bureau has found, as in the case of newspapers previously examined, that the papers containing the purer fibers were in the better condition. The papers were composed of rag, straw, and wood fibers, either alone or in mixtures. Those containing the chemically treated rag and wood fibers were generally undiscolored and apparently had retained their strength well, while papers containing crude straw and ground wood fibers were generally brittle and discolored.

The publication dates of the books ranged from 1779 to 1930. The papers were composed of rag fibers until 1867. From this date until 1875 many consisted of rag with various mixtures of straw and chemically treated wood fibers. The first ground wood fibers were in a book published in 1875, and these fibers were found, largely in various mixtures with other fibers, quite extensively until around 1910; therefore the permanence of papers in books published during this period is open to suspicion. The oldest paper made entirely of chemically treated wood fibers was in a book dated 1889. In several books there was a mixture of the poorest grades of papers with the best grades, which explains some of the uneven deterioration of pages often observed in old books.

ACCELERATED WEATHERING OF PAINTS AND ENAMELS

The bureau's apparatus for the accelerated weathering of paints has been in practically continuous operation during the month. Exhibits have been prepared showing, in a compact manner, "before-and-after" exposure results on 30 international orange paints after 55 days of accelerated exposure. The arrangement for showing the results on each paint involves the use of a coin envelope 2¼ by 3½ inches. Two circular holes (1 inch in diameter) are cut in the envelope. A section of the panel showing the appearance of the paint prior to exposure is placed in the envelope underneath one of the holes. Another section of the panel after being exposed for 55 days in the accelerated test is placed in the same envelope underneath the other hole. This makes a convenient way of sending exhibits with reports.

RED-LEAD PAINT

In recent years a very fine grade of red lead has appeared on the market. Its true red-lead content will vary from 95 to over 99 per cent Pb_3O_4. Its texture is soft, very fine, and its color is lighter (a bright red-orange) than the average red lead. Its apparent bulk is much greater than the ordinary red lead. Where the ordinary red lead requires about 32 pounds to the gallon of linseed oil to make a paint of good brushing properties, the fine grade of red lead requires only 16 pounds to the gallon of oil. The finish of the paint coat is more glossy with the fine red lead. It has been observed at the bureau that using 95 per cent grade red lead and 85 per cent grade red lead in the same thinning formula, the 95 per cent grade gives more gloss to the paint coat. The first or "shop coat" paint on metal should dry to a dull finish so that the "field coats" may adhere properly. One mistake commonly made is to apply a priming coat paint made from red lead and linseed oil. The paint dries to a slick, glossy finish, and trouble is encountered in trying to apply another paint over this surface. The red-lead paint should contain turpentine (or mineral spirits) and drier. Apparently with the increasing use of the fine grade of red lead this trouble from glossy undercoats is increasing. Less oil and much more volatile thinner than is now used will probably be the answer.

ROOF EXPOSURES OF RED-LEAD PAINTS

Nearly four years ago (January, 1929) a number of red-lead paints (all experimental) were exposed on the roof of the chemistry building of the bureau. These paints varied from 20 up to 100 pounds of red lead to the gallon of linseed oil. All paints were applied in two coats on sand-blasted steel panels. At this date, the two lightest-weight paints have failed by rusting. These are 20 and 22 pounds of red lead to the gallon of oil. Paint containing 25 pounds of red lead to the gallon of oil is now showing definite (but not bad) rusting. All of the other paints appear to be in sound condition. Under the microscope the appearance of the panels shows that red-lead paints fail (exclusive of appearance) by chalking and cracking—possibly first checking. Microscopic

examination of the paint coat will show rather bad checking a long time before rust begins to appear. Even when these checks develop into cracks apparently extending down to the sand-blasted steel, rusting does not appear for some time.

IDENTIFICATION OF SEALING WAX

The bureau has examined a series of seals made on paper with sealing wax. The object was to find out whether one of the seals was made with the same wax as any of the others. Two entirely different test methods led to the same conclusions. The first was to treat a small piece of the wax with a mixture of alcohol and turpentine, to dissolve the resins. The solution and the insoluble mixture of pigments differed widely in appearance. A small piece of each wax was then melted on a microscope slide and flattened to a thin film by pressing a cover glass down upon it. The unaided eye showed differences in the appearance of the samples, and microscopical examination brought out further differences. The sample which led to the examination stood out from all the others.

PLASTICITY OF GROUND-COAT ENAMELS

It has several times been pointed out in publications on enamel that the elastic properties of an enamel, along with its tensile strength and coefficient of expansion, are indicative of its resistance to mechanical failure. A considerable amount of experimental work has been reported in the literature regarding the coefficient of expansion of enamels, including an article in Technical News Bulletin No. 184 (August, 1932).

The same group of ground-coat enamels mentioned in the above item have been tested for modulus of elasticity, the specimens being rods of enamel about 0.3 to 0.5 mm in diameter and 60 mm in length. Sodium oxide and boric oxide were substituted one for another between the limits 11 to 17 and 13 to 19 per cent, respectively, and flint and feldspar were substituted one for another within the limits 25 to 35 per cent. These variations in composition produced no marked effect upon the modulus of elasticity of the enamel. The lowest mean value was about 8,150 kg/mm^2, and the highest about 8,320 kg/mm^2, an increase of scarcely more than 2 per cent.

The conclusion was that within the limits of composition studied, which are rather typical of commercial practice, variations in modulus of elasticity may be overlooked as an important factor affecting the resistance of the enamels to mechanical failure.

MELTING POINT OF LEAD OXIDE

A study of phase equilibria in the system PbO-K_2O-SiO_2 has been started recently, and the results should prove of value to producers of glazed ceramic ware and of glass containing lead. Practically all of the glazes, on ceramic whiteware and pottery as well as vitreous enamels, contain K_2O introduced as feldspar, many contain lead, and all contain silica. A number of investigations of the system PbO-SiO_2 are recorded, but the resultant diagrams are so conflicting as to justify further study.

The first step in this study was the determination of the melting point of PbO. The material used is a sublimed litharge containing no detectable quantities of zinc, nickel, or manganese; less than 0.001 per cent iron; 0.002 per cent copper; and 0.018 per cent bismuth. The melting point, determined by means of heating curves and a bare Pt to Pt-Rh couple inserted in the melt, was 886±2° C. This compares favorably with the value of 886° determined in 1931 by Krakau and Vachrameev. Many other values are given in the literature, varying from 830° (1897) to 906° (1907), but most of the values lie between 875° and 890° C.

HIGH-TENSION INSULATOR PORCELAINS

Glazed and unglazed rods of high-tension insulator porcelains, which had been heated in commercial kilns to the regular maturing temperatures (averaging approximately cone 10, or 1,250° C.) from one to seven times, were submitted by three manufacturers. These rods were tested for resistance to failure in bending and in compression. They were tested also to determine modulus of elasticity, strain between glaze and body, and linear thermal expansion. Specimens from one manufacturer were examined petrographically.

Modului of rupture of the glazed rods subjected to the maximum number of reheatings had decreased from 15 to 70 per cent, and the maximum decrease in resistance to crushing was 50 per cent; equivalent values for unglazed rods showed decreases of from 5 to 25, and 35 per cent, respectively.

Decrease in strength of unglazed rods is attributed to an altered and probably "overfired" condition of the

body, while the greater decrease in strength of glazed rods as compared with unglazed is attributed to a combination of the altered body and stresses produced by the glaze.

The final report is scheduled to appear in the January, 1933, Bulletin of the American Ceramic Society.

BASE-EXCHANGE CAPACITIES OF CLAYS

In studying a number of English china clays it was found that their exchangeable-base capacity seemed to be a distinguishing property. As a consequence the work was extended to other clays, and at the present time the total exchangeable-base capacities of 25 different clays have been determined. The clays now studied are divided into four groups, and their maximum, minimum, and average base-exchange capacities are given below in milliequivalents per 100 grams of clay.

	Maximum	Minimum	Average
13 English china clays	7.2	2.5	4.9
6 American kaolins, excluding Florida kaolins	7.4	4.1	5.7
3 Florida kaolins	15.7	7.8	12.6
3 ball clays	15.7	5.8	11.8

It will be noted that the American kaolins, with the exception of those from Florida, differ only slightly in this property from the English china clays, the former having higher exchange capacities. The Florida kaolins have base-exchange capacities conforming to those of the ball clays. The latter include 1 Tennessee clay, which gave the lowest value; 1 Kentucky clay; and 1 English clay, which showed the highest exchange capacity.

NEW AND REVISED PUBLICATIONS ISSUED DURING NOVEMBER, 1932

Journal of Research[1]

Bureau of Standards Journal of Research, vol. 8 (RP Nos. 396 to 452, inclusive), bound in cloth, $3 ($3.75 foreign).

Bureau of Standards Journal of Research, vol. 9, No. 5, November, 1932 (RP Nos. 493 to 500, inclusive). Price, 25 cents. Obtainable by subscription.

Research Papers[1]

(Reprints from Journal of Research)

RP471. A new determination of the atomic weight of osmium; R. Gilchrist. Price, 5 cents.

RP472. "Moisture expansion" of ceramic whiteware; R. F. Geller and A. S. Creamer. Price, 5 cents.

RP473. Infra-red arc spectra photographed with xenocyanine; W. F. Meggers and C. C. Kiess. Price, 5 cents.

RP474. Tensile properties of cast nickel-chromium-iron alloys and of some alloy steels at elevated temperatures; W. Kahlbaum and L. Jordan. Price, 5 cents.

RP475. The comparison of high voltage X-ray generators; L. S. Taylor and K. L. Tucker. Price, 5 cents.

RP476. The structure of the chromic-acid plating bath; the theory of chromium deposition; C. Kasper. Price, 5 cents.

RP477. Physical properties and weathering characteristics of slate; D. W. Kessler and W. H. Sligh. Price, 10 cents.

RP478. Radiation from cæsium and other metals bombarded by slow electrons; C. Boeckner. Price, 5 cents.

RP479. A simplified precision formula for the inductance of a helix with corrections for the lead-in wires; C. Snow. Price, 5 cents.

RP480. Register studies in offset lithography; C. G. Weber and R. M. Cobb. Price, 5 cents.

RP481. Creep at elevated temperatures in chromium-vanadium steels containing tungsten or molybdenum; W. Kahlbaum and L. Jordan. Price, 5 cents.

RP482. The synthesis, purification, and certain physical constants of the normal hydrocarbons from pentane to dodecane, of *n*-amyl bromide and of *n*-nonyl bromide; B. J. Mair. Price, 5 cents.

[1] Send orders for publications under this heading only to the Superintendent of Documents, Government Printing Office, Washington, D. C. Subscription to Technical News Bulletin, 50 cents per year (United States and its possessions, Canada, Cuba, Mexico, Newfoundland, and Republic of Panama); other countries, 70 cents. Subscription to Journal of Research, $2.50 per year; other countries, $3.25. Subscription to Commercial Standards Monthly, $1; other countries, $1.60.

[1] Send orders for publications under this heading only to the Superintendent of Documents, Government Printing Office, Washington, D. C. Subscription to Technical News Bulletin, 50 cents per year (United States and its possessions, Canada, Cuba, Mexico, Newfoundland, and Republic of Panama); other countries, 70 cents. Subscription to Journal of Research, $2.50 per year; other countries, $3.25. Subscription to Commercial Standards Monthly, $1; other countries, $1.60.

RP483. A study of some ceramic bodies of low absorption maturing at temperatures below 1,000° C.; R. F. Geller and D. N. Evans. Price, 5 cents.

RP484. The determination of magnesia in phosphate rock; J. I. Hoffman. Price, 5 cents.

RP485. Collisions of the first and second kind in the positive column of a cæsium discharge; F. L. Mohler. Price, 5 cents.

RP486. The areas and tensile properties of deformed concrete-reinforcement bars; A. H. Stang, R. L. Sweetman, and C. Gough. Price, 5 cents.

RP487. A calorimetric method for determining the intrinsic energy of a gas as a function of the pressure; E. W. Washburn. Price, 5 cents.

RP488. The photographic emulsion: Variables in sensitization by dyes; B. H. Carroll and D. Hubbard. Price, 5 cents.

RP489. A method for the separation of rhodium from iridium and the gravimetric determination of these metals; R. Gilchrist. Price, 5 cents.

RP490. The isoelectric point of silk; M. Harris. Price, 5 cents.

RP491. Effective applied voltage as an indicator of the radiation emitted by an X-ray tube; L. S. Taylor, G. Singer, and C. F. Stoneburner. Price, 5 cents.

RP492. Column curves and stress-strain diagrams; W. R. Osgood. Price, 5 cents.

Simplified Practice Recommendations[1]

R87–32. Forms for concrete joist construction floors. Price, 5 cents.

R92–32. Hard fiber twine and lath yarn (ply and yarn goods). Price, 5 cents.

R105–32. Wheelbarrows. Price, 5 cents.

R133–32. Surgical dressings. Price, 5 cents.

Building and Housing[1]

BH18. Recommended minimum requirements for small dwelling construction. (Revision of BH1.) Price, 10 cents.

[1] Send orders for publications under this heading only to the Superintendent of Documents, Government Printing Office, Washington, D. C. Subscription to Technical News Bulletin, 50 cents per year (United States and its possessions, Canada, Cuba, Mexico, Newfoundland, and Republic of Panama); other countries, 70 cents. Subscription to Journal of Research, $2.50 per year; other countries, $3.25. Subscription to Commercial Standards Monthly, $1; other countries, $1.60.

Commercial Standards Monthly[1]

Commercial Standards Monthly, vol. 9, No. 5, November, 1932. Price, 10 cents. Obtainable by subscription.

Technical News Bulletin[1]

Technical News Bulletin No. 187, November, 1932. Price, 5 cents. Obtainable by subscription.

LETTER CIRCULARS

It is the intent of the bureau to distribute single copies of these mimeographed letter circulars on request only to those parties having a special interest in the individual letter circular. Economy necessitates limitation in the number of copies issued. It is not the intent to supply parties with a copy of each letter circular issued during the month. Letter circulars are necessarily of a temporary nature designed to answer numerous inquiries on a given subject. Requests should be addressed to the Bureau of Standards, Washington, D. C.

LC348. Publications and mailing matter of the division of building and housing.

LC349. Modifications in recommended building code requirements for working stresses in building materials.

LC350. Publications on glass technology, and standard samples of interest to the glass industry.

OUTSIDE PUBLICATIONS[2]

Denison, I. A., Method for estimating corrosiveness of acid soils in contact with iron and steel pipe. Oil and Gas Journal (Tulsa, Okla.), September 29, 1932.

Bearce, H. W.:
The proposed revision of the Gregorian calendar, Scientific Monthly (New York, N. Y.), p. 500, December, 1932.

[1] Send orders for publications under this heading only to the Superintendent of Documents, Government Printing Office, Washington, D. C. Subscription to Technical News Bulletin, 50 cents per year (United States and its possessions, Canada, Cuba, Mexico, Newfoundland, and Republic of Panama); other countries, 70 cents. Subscription to Journal of Research, $2.50 per year; other countries, $3.25. Subscription to Commercial Standards Monthly, $1; other countries, $1.60.

[2] "Outside publications" are not for distribution or sale by the Government unless otherwise noted. Requests should be sent direct to publishers.

Bearce, H. W.—Continued.
Tests of accuracy of inch as standard of measure, United States Daily (Washington, D. C.), vol. 7, No. 217, p. 8; November 30, 1932.
Smith, R. W., What do you weigh today? Scientific Monthly (New York, N. Y.), p. 557, December, 1932.
Coblentz, W. W.:
The physics of ultra-violet and infra-red radiation, International Clinics (J. B. Lippincott Co., Philadelphia, Pa.), June, 1932.
Ultraviolettstrahlung für Therapeutische werke. Welche minimumintensität muss ein ultraviolettstrahler aufweisen? Strahlentherapie (Dr. Hans Meyer, Bremen, Germany), vol. 45, No. 3, p. 433, November, 1932.
Fowler, R. M., Determination of silicon in steels, Industrial and Engineering Chemistry, analytical edition (Washington, D. C.), vol. 4, p. 382; October 15, 1932.
Heyl, Paul R., Old and new ideas regarding gravitation, Journal of Chemical Education (New York, N. Y.), vol. 9, No. 11, p. 1897, November, 1932.
Beij, K. Hilding, Aircraft speed instruments, National Advisory Committee for Aeronautics (Washington, D. C.), Report No. 420, 1932. Obtainable from Superintendent of Documents, Government Printing Office, Washington, D. C., at 10 cents per copy.
Emley, W. E.:
United States Institute for Textile Research, Journal of Chemical Education (New York, N. Y.), vol. 9, No. 11, p. 1882, November, 1932.
The Textile Foundation (Inc.), Journal of Chemical Education (New York, N. Y.), vol. 9, No. 11, p. 1886, November, 1932.
McPherson, A. T., Study of strange properties of rubber, United States Daily (Washington, D. C.), vol. 7, No. 220, p. 8, December 5, 1932.
McAllister, A. S., The certification plan of the Bureau of Standards, The Agricultural Leaders' Digest (Chicago, Ill.), vol. 13, No. 6, p. 44; November, 1932.

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